FIREPROOF STEEL CARS

Great Results Effected by This Safeguard.

RAILROAD EVOLUTION.

New Cars Absolutely Non-Collapsible—To Eliminate Smallest Amount of Wood—All Lighted by Electricity—Latest Type of Coupler.

"All future passenger equipment of the Pennsylvania railroad will be made of steel. The necessity of providing non-collapsible, absolutely fireproof passenger cars for the New York tunnel has simply hastened the day when this transformation must take place. The car of the future must be as safe as engineering science can make it."

Such was the declaration, says the New York Herald, of a high official in the motive power department of the Pennsylvania railroad. It followed examination of reports which have been made on the cost and performance of the new Pennsylvania coach, No. 1,661, the first steel passenger car to be built in the world.

The future passenger equipment is to be of steel therefore, not only steel frame and box, but steel and non-combustible material in every particular. This will involve a very large expenditure of money, but the management feels that no expense should be spared to remove the danger from fire and collision in future railroading.

The first car to be built anywhere wherein the main object has been to secure the elimination of every particle of non-combustible material is No. 1,561.

The new car weighs 103,550 pounds against 84,900 for the standard wooden coach, but it is found that the added weight very greatly reduces the vibration and adds to the comfort of the passengers. No inconsiderable part of the additional weight is due to the great burden involved in carrying storage batteries and battery boxes. All the new cars are to be lighted by electricity, and the Pennsylvania will carry no gas illuminated cars of any kind in its New York tunnel. The electric wires in the new cars are all thoroughly insulated in heavy metal conduits, thus adding to the safety.

Motive power officials believe that the weight of the present car can be still further reduced, although it will always be heavier than the wooden coach. The steel coach has a small quantity of combustible material, and in the effort to remove this absolutely it may be necessary to add weight in slight particulars

The new car is absolutely non-collapsible. It could stand any load or any collision. Its hidden frame is like a cantilever bridge suspended on the trucks as piers. This safety against telescoping is secured by the use of enormous steel girders, the principal feature in the body of the car being a central box girder 24 inches wide and 19 inches deep, extending throughout the length of the coach.

In the past railroads have found that when trains collided and the body of one car rose above the body of the next there was a tendency for the underframe of the first car to sweep the superstructure of the second car off its underframe In the new equipment this is prevented by the extraordinary strength in the door and vestibule end posts, which are of course of very heavy rolled steel.

To show something of the effort made to make this car absolutely fireproof, it is only necessary to state that the flooring throughout the car and platform consists of an imitation of stone spread while in a plastic state over the steel plates of the car The framing above the windows is composed of steel plates The doors are composed of steel plates pressed into a shape imitating the wooden doors used in other cars, and filled with cork to deaden the sound. The roof is constructed of composite boards covered with copper sheathing The inside lining consists of composite boards covered with fireproof paint.

It is the policy of the Pennsylvania to eliminiate eventually even the smallest amount of wood or other burnable material in its cars. In the experimental car the seats are of steel frame, covered with fireproof plush. The foot rests are also of steel.

A coupler arrangement of a new type, stronger than anything ever used before, has been designed for this car to avoid any possibility of breakage and the resultant parting of trains.

The company has been making elaborate tests to ascertain the effect of the temperature of the atmosphere on the steel, as compared with the old wooden car. It is found that in hot weather the difference is very slight, and that the steel car shows a decided inclination to cool off more rapidly than the wooden coach.

Should Be Electrocuted.

"What do you thing of that painting?" asked Mrs. Neurich, pointing to a recent art purchase.

"I think," rejoined the critical friend, "that hanging is too good for it."—Chicago News.

Follow the dictates of your conscience and it's doughnuts to fudge you'll never land in jail.

WHEN ONCE AN ARMY MAN

Always an Army Man—The Re-enlistments and the Pay.

The betterment of the personnel of the army and the manner of raising the moral status of the fighting service of Uncle Sam has long been a question of considerable moment to both officers and enlisted men generally. Every means possible has been exercised through recruiting officers and other ways for the weeding out, or the prevention of enlistment of, the undesirable class of men who apply for admission to the service According to an army officer, not only is the moral status of deep consideration, but the efficiency of the troops, though secondary to the first, is a matter that receives much thought It is the purpose of the army officers to encourage the re-enlistment of soldiers on account of their experience in the service, and another object aimed at in this is to have the men re enlist in the arm of the service from which they were discharged

In speaking of the matter of re-enlistment in the service, Lieut Roger O Mason, of the artillery corps, in the Kansas City Journal said

"The matter of re-enlistment is an important one to the army A re-enlisted soldier is one desired by every officer in the service, and the general desire of those interested in the welfare of the service is that a man return to the arm from which he was discharged This is only general in some of the arms of the service as one will offer what a man will believe to be advantages that others do not, and often a man will become tired of the arm in which he served and re-enlist for other kind of service The matter of enlistments every officer has had more or less keenly brought home to him

"Many men endeavor to enlist because they imagine that in the service they will have little to do, plenty to eat, with the compensation allowed by law besides These men constitute the 'do-little-as-you-can' class, never make good soldiers and though they may be physically desirable in isolated cases, would in the majority but constitute the nucleus for the discontented and indolent They invariably when enlisted remain in the service only until suitable weather conditions present themselves, when they desert and again take up their interrupted profession, generally of hoboing This cannot be without expense to the government and endless trouble and vexation to both regimental and company commanders.

"I would suggest an offer of greater advantage of seeing their native land or land of adoption by frequent change of station and to offer greater pecuniary return in the grade of non-commissioned officers, thereby offering greater inducement to men to enlist and re-enlist

"The pay of non commissioned officers in the army runs from $15 to $34 a month Aside from this there is but one monetary incentive for the soldier to strive for by efficiency, and that is in the artillery To each soldier who qualifies as first class gunner, whether he be a private or non-commissioned officer, is paid an additional $2 on his monthly salary, and the man qualifying as second-class gunner receives an additional $1 per month. In the navy the inducements are greater in this line, as there are six advancements in the gun pointer class that a man can make They run from secondary gun pointers, second class, which allows $2 additional monthly pay, to heavy gun pointers, first class, which pays to the man who qualifies $15 extra each month. There is a considerable difference in the pay allowed gunners in the navy and in the army, and while I would not seek to augment expenses, yet it is my contention that we cannot do otherwise than to offer to the men of the artillery arm a like return for service rendered.

"In the artillery we have the continual change of men, which may be determined by the small percentage of re-enlistments that takes place in the batteries of the artillery

"The pay of our master gunners should be equal to the pay of a petty officer in the navy and of our gun commanders equal to that of petty officers, first class, as for instance, turret captains, first class, which position offers rate of pay of $50 a month.

"According to the calibre of the gun to which the organization is assigned, the gun commander should receive pay in proportion to the calibre, $50 a month being the maximum rate.

"The pay of first sergeants of artillery should be increased to $45 a month; corporals to that of $20 a month. The pay of our sergeants-major, senior grade, $55 per month; that of sergeants-major, junior grade, to $50 per month. While this change in pay is a material one and of course would augment the expense list of the artillery arm, yet it is my contention that if we desire enlistments of those men that are to be had if a better inducement is offered we must provide for this. The pay of our enlisted men should remain as it now is, $13 a month, with the opportunity of taking examinations now in force for first and second class gunners. However, I would suggest that only that of the first class gunner be entitled to any increase in pay. Such increase to be $5 per month."

With some men life is but a hog path leading to the cemetery.

EARTH HARD AS NICKEL STEEL.

The Sun 2,000 Times as Solid—Calculations Made by Professor See.

In the Astronomische Nachrichten Prof T. J. J See, United States Navy, gives the results of an investigation he has been making of the rigidity of the earth and other heavenly bodies, by mathematical processes depending wholly on the theory of gravitation.

This line of investigation was begun in 1865 by Lord Kelvin, who sought to determine the rigidity of the earth from observations of the tides of the oceans. It was thought that if the earth proved to be highly rigid, the result would contradict the theory long held by geologists that the earth is a globe of molten matter enclosed in a thin crust like the shell of an egg

Lord Kelvin reached the conclusion that the earth as a whole is certainly more rigid than glass, but perhaps not quite as rigid as steel

About 1880 Prof George Darwin took up the investigation. By careful study of the fortnightly tides he found the earth to be more rigid than steel. This was held to show that the earth could not be a sphere of liquid covered by a thin crust, and geologists had to change their theories so as to conform to a globe as rigid as steel.

Prof See's investigation is purely mathematical, and based on the pressure existing throughout the earth. According to Laplace's law of density the density at the center of the earth is equal to that of lead, and the pressure equal to that exerted by a vertical column of quicksilver as long as from St Louis to San Francisco.

By considering the pressure throughout the whole earth Prof See finds that even if fluid the globe would have a rigidity greater than that of wrought iron He finds that the average rigidity of the whole mass is nearly equal to that of nickel steel, such as is used in the armor of a battleship

Dr See proves that the rigidity of the earth's crust is about equal to that of granite which is one sixth that of steel and that toward the center the center the rigidity rapidly increases. At the earth's center the imprisoned matter is at an enormously high temperature, yet under the tremendous pressure there at work kept three times more rigid than the nickel steel used in the armor of a battleship

His new method can be applied also to the other planets It turns out that the rigidity of Venus is greater than that of platinum, and, most likely, about identical with that of wrought iron The rigidity of Mars is about equal to that of gold, while the rigidity of Mercury, the moon and other satellites, is about equal to that of glass

The average rigidity of the great planets, Jupiter, Saturn Uranus and Neptune, lies between eighteen times and three times that of steel The great rigidity of these bodies is due to the pressure acting throughout such large masses

In the case of the sun the result is still more extreme The average rigidity of all the sun's layers is more than 2000 times that of nickel steel

Having shown by laborious calculation that these bodies are so rigid, Prof See has gone one step further and inquired what effect this rigidity will have on the currents often supposed to circulate within these masses Pressure directly increases the fluid friction of moving currents and tends to bring them to rest.

Many geologists have held that liquid currents exist in the earth, and astronomers have been accustomed to assume that fluid currents in the sun descend almost to its center. Prof. See denies the possibility of currents in the earth, and declares that currents in the sun and great planets must all be quite shallow and cannot descend to any great depth, because the pressure and rigidity are too great.

In the case of the earth he says we cannot well conceive of currents in matter more rigid than granite, and in the case of the sun a rigidity of twenty-two times that of nickel steel only one-tenth of the way to the center, makes circulation of currents below that depth likewise inconceivable.

Science and Frosts.

An ingenious device to divert the danger from frosts may be described as the artificial shower. The story of how this is used on one California ranch is told in a United States government publication. The owner of this ranch caused to be erected on it a number of masts fifty feet high. At the top of each mast was fastened a sprinkling device through which water could be forced. On nights when the temperature sinks to the frost point the pumps begin to work, the sprinklers commence to sprinkle and the air is filled with a fine spray which so charges it with moisture that in nearly every instance the protection given the ripening fruit has been sufficient. The owner of a little patch of garden and a garden hose, if he will get up just before sunrise on a frosty morning, may save his precious vegetables by springling them. He is doing in a small way what the ranchman of California accomplishes by the use of the fifty foot mast with the sprinkler at its top.

The last man to improve the world is the one who is satisfied with himself.—Chicago Tribune.

A kiss in time may prevent nine.

IN THE NEW WORLD OF AIR.

Fifteen Years Since Americans Sent Up Exploring Kites.

The methods for sounding the atmosphere employed at the present day have been in our possession but a few years, says Nature Magazine The kite carrying self-registering apparatus was introduced by the Americans about fifteen years ago; the sounding balloon dates but twelve years back The use of balloons furnished with registering apparatus was proposed by Lemonnier, a French physicist, at the end of the eighteenth century, but they were actually employed for the first time by the Brothers Renard, and especially by MM Hermite and Besancon, whose first observations go back to 1893

Observations of great interest had already been made on mountains To these are now added observations made in air altogether free.

The distribution of the barometric pressure at a distance of several thousand metres above the ground was first examined, and maps were shown giving the isobars at 4,000 metres, as calculated from the pressure and temperature on the surface of the earth.

M. Teisserenc de Bort has carefully verified that the pressure in free air diminishes in accordance with the barometric formula For that purpose he determined the heights of a large number of balloons by observing them with two theodolites On the average the heights thus observed agree with those deduced from the barometers carried by the balloons to within two or three millimetres of barometric pressure for a height of 4,000 metres. The maps of the isobars at 4,000 metres show that most of the areas of high and low pressure observed near the ground become effaced as we rise in the air and give place to a pressure distribution of a much simpler kind, viz., a maximum of pressure all around the earth in the tropical regions, and low pressures at the poles The average direction of cirrus clouds is in harmony with these conditions.

As regards the distribution of temperature the following conclusions were established

1 Even at a height of several thousand metres above the ground there is, contrary to what had been thought, a very sensible variation of temperature from winter to summer, the divergence of temperature between the coldest and the hottest month being 9 deg C at 10 kilometres height.

2 After it had been noticed that the rate of fall of temperature increases with the height above ground it was naturally supposed that temperatures at great heights in the air were extremely low But sounding balloons despatched from the Trappes Observatory have proved that after a certain height, varying from 9 to 14 kilometres the fall of temperature ceases altogether another fact that was wholly unexpected

3 The zone where the temperature ceases to fall, called the isothermal zone, is situated nearer the ground (8 to 9 kilometres in certain places) with low pressures, and further from the ground (about 12 to 13 kilometres) above high pressure areas

4 As a general rule it is colder in the upper part of an anticyclone than it is at a corresponding height above low pressures but the contrary holds at medium heights of about 5 kilometres The absolutely lowest temperatures are observed near high pressures A temperature of 73 deg has been observed several times at Trappes and recently as low as —80 deg. in Austria

5 Balloon flights made daily for a week or more at a time, in different years, and at different seasons, have shown that at intervals of a few days the atmosphere experiences variations of temperature which are much more important high up than on the ground. At a height of 11 kilometes variations of 15 deg. to 20deg are often observed at a time when variations of only 2 deg to 3 deg are found near the ground

It is believed that the arrest of the decrease of temperature is connected with the cessation at a certain height of movements of the air having a vertical component, the air then having movements which follow the isobaric surfaces There is no longer any temperature variation due to expansion or compression of the air.

A Nuisance.

What? Who? Any one who rings the door-bell and leaves a handbill wound about the door-knob. A man or boy may not be seriously thought of who ventures upon private property and noiselessly leaves his advertisement; but he who comes to the door, rings the bell, takes one from their work, simply to find the programme of a minstrel troupe or even a sacred concert, takes an unauthorized liberty, and, as the matter stands now, through an almost daily repetition, becomes a nuisance. Whoever you are, man or boy, remember this, you have no more right to pull a door-bell for the purposes of advertisement than you have to pull a person's nose.

Heavy Cares.

Sweet little maiden (age 10)—Ah, I am afraid Alfred and I will never understand one another. I want to man who has a millinery store and he always wants to have a candy store.—Figaro.

The phonograph isn't to blame if it has a bad record.

Much of the queerness affected by humanity is cultivated.